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V. *Some Remarks on the Variations of the Magnetical Compass published in the Memoirs of the Royal Academy of Sciences, with regard to the General Chart of those Variations made by E. Halley ; as also concerning the true Longitude of the Magellan Streights.*

IT must be acknowledged that the Gentlemen of the *Royal Academy of Sciences in France*, have, for some Years past, apply'd themselves with much Candour, as well as Diligence, to examine the Chart I publish'd in the Year 1701, for shewing at one View the Variations of the Magnetical Compass, in all those Seas with which the *English* Navigators are acquainted : And, to my no small Satisfaction, I find that what I did so long ago, has been since abundantly verified by the concurrent Reports of the *French* Pilots, who of late have had frequent Opportunities of enquiring into the Truth thereof. So that I am in hopes I have laid a sure Foundation for the future Discovery of an Invention, that will be of wonderful Use to Mankind when perfected ; I mean that of the Law or Rule by which the said Variations change, in Appearance regularly, all the World over. Of this I have adventured long since to give my Thoughts in N^o 148 and N^o 195 of these *Transactions*, and as yet I see no Cause to retract what I there offer for a Reason of this Change ; but of this we might be more certain, had we a good Collection of Observations made in that Ocean which divides *Asia* and *America*, and occupies about two fifths of the whole Circumference of the Globe. This, we hope, from the natural Curiosity of the *French* (who want no Means of performing it) may be effectually supply'd by such of that Nation who may return from *Peru* by the *East-Indies*.

In the mean time I cannot omit to take Notice of two Particulars, seeming to call in Question the Truth of my aforesaid Map, which I have lately observed in the *Memoirs* of the *Royal Academy of Sciences*.

The one is in the *Memoirs* of the Year 1700, concerning the Variation observed at *Paraíba* in *Brafile*, about 25 Leagues to the Northwards of *Pernambouc*, by M. Couplet *le fils*, whose Words are these,

Le 20 Mai, 1698. ayant auparavant tracé seigneusement une ligne Meridienne, dont je m'étois servi pour les Observations Astronomiques, j'observai la déclinaison de l'aiguille aimantée de $5^{\circ} 35'$ Nordouest. And the same Observer tells us, that he found the Latitude of the Town of *Paraíba* $6^{\circ} 38' 18''$. Now it so fell out, that my self was in the River of *Paraíba*, in the Month of *March*, 1699. and there fitted and cleaned my Ship, so that I had full Opportunity to observe the Variation both on Board and on Shore, and found it constantly to be above 4 Gr. *North-East*; so that I am willing to believe this to be an Error of the Press, putting N. W. for N. E; or rather of the Memory of M. Couplet, who, it seems, lost all his Papers by Shipwreck in his Return. The like may be said of the Latitude of *Paraíba*, which, though I did not observe my self, yet at the Fort of *Cabo Dello*, at the Mouth of the River, and which is about 3 Leagues more Northerly than the Town, I found the Latitude not less than $6^{\circ} 55'$ South, and by Consequence that of the Town more than 7 Degrees.

The other is in a Discourse of M. de Lisle, in the *Memoirs* of 1710; where he compares the Variations observed in some late Voyages, with my Map of the Variations. Among other Things, 'tis there said, that on the East-side of the Island *St. Thomas*, under the Equinoctial Line, M. Bigot de la Canté, second Lieutenant of the King's Ship *la Sphere*, had, in the beginning of the Year 1708, found the Variation $11\frac{1}{2}$ Gr. whereas my Chart makes it but $5\frac{1}{2}$ Gr. 'Tis true, that I never observed my self in those Parts; and 'tis from

from the Accounts of others, and the Analogy of the whole, that in such Cases I was forc'd to supply what was wanting ; and 'tis possible that there may be more Variation on that Coast than I have allowed. But consulting my Chart (which was fitted to the Year 1700) I find I then make the Variation at the Isle of *St. Thomas* full $7\frac{1}{2}$ Gr. and not $5\frac{1}{2}$ Gr. the which, by the Year 1708, might well arise to near 9 Gr. So that the Difference will become very tolerable ; whereas an Error of 6 Degrees, such as is here represented, would render the Credit of my Chart justly suspected, and the same by consequence wholly usefess, as not to be confided in.

But a further Thing I might complain of is, that in the same *Memoire* of *M. de Lisle*, the Geography of my Chart is called in Question ; and we are told that I have placed the Entrance of the *Magellan* Straights at least 10 Degrees more Westerly than I ought to have done : for that the Ship *St. Louis*, in the Year 1708, sailing from the Mouth of *Rio Gallega*, in about the Latitude of 52 Gr. South, and not far from Cape *Virgin*, directly for Cape *Bonne Esperance* (which Course perhaps was never run before) had found the Distance between the two Lands not more than 1350 Leagues, which, he concludes, is much less than my Chart of the Variation makes it. I know not from what Computation *M. de Lisle* has deduced this Consequence, but I find by my Chart that I have made the Longitude of *Rio Gallega* 75 Gr. West from London, and that of Cape *Bonne Esperance* 16 $\frac{1}{2}$ East from it ; that is in all 91 $\frac{1}{2}$ Gr. difference of Longitude. This, with the two Latitudes, gives the Distance, according to the Rhumb-line 1364 Leagues, but according to the Arch of a great Circle, no more than 1287 Leagues ; so that instead of invalidating what I have there laid down, it does absolutely confirm it, as far as the Authority of one single Ship's Journals can do it.

I do not pretend that I have had Observations made with all the Precision requisite, to lay down incontestably the *Magellan Straights* in their true Geographical Site; but yet it has not been without good Grounds that I have placed them as I have done. For when Sir *John Narborough*, in the Year 1670, wintered in Port *St. Julian*, on the Coast of *Patagonia*, Capt. *John Wood*, then his Lieutenant, and an approved Artift in Sea Affairs, did observe the beginning of an Eclipse of the Moon, *Sept. 18^{vo} Stil. vet.* at just 8 at Night: And the same beginning was observ'd by *M. Hevelius* at *Dantzick* at 14^h 22'; whence Port *St. Julian* is more Westerly than *Dantzick* 6^h 22', or than *London* 5^h 6, that is 76 $\frac{1}{2}$ Gr. Besides, I have had in my Custody a very curious Journal of one Capt. *Strong*, who went into the *South Seas* in quest of a rich Plate-wreck, and who discover'd the two Islands he called *Falkland's Isles*, lying about 120 Leagues to the Eastwards of the *Patagon Coast*, about the Lat. of 51 $\frac{1}{2}$. This Capt. *Strong* had a quick Passage from the Island of *Trinadada* (in 20 $\frac{1}{2}$ South) to the *Magellan Straights*; and in this Journal, which was very well kept, I found that Cape *Virgin* was, by his Account, 45 Degrees of Longitude more Westerly than that Island, whose Longitude I know to be just 30 Degrees from *London*: that is in all 75 Gr.

From these concurrent Testimonies, wanting better, I adventured to fix the Longitude of this Coast as I have done; and I can by no means grant an Error of 10 Degrees to be possible in it, though perhaps it may need some smaller Correction. I will however readily grant, that those that go thither from *Europe*, shall find the Land more Easterly than is here express'd, by reason of a constant Current setting to the Westward near the Equator, where Ships are many times long detained by Calms, whilst the Stream carries them along with it; which thing befalls all Ships bound to any Part of the East Coast of the *South America*.